

What is claimed is:

- 1        1. A test chamber for testing a frequency response of an output for a low band antenna
- 2        array having a plurality of monopole antennas by providing an RF (radio frequency) test signal
- 3        into an interior of said test chamber, comprising:
  - 4            (a) a rectangular shaped base;
  - 5            (b) first and second side walls extending perpendicularly
  - 6            upward from said base, a rear wall extending perpendicularly upward from said base
  - 7            and a front wall extending perpendicularly upward from said base, one end of each of
  - 8            said first and second side walls being attached to a separate one of the opposed ends of
  - 9            said front wall and the other end of each of each of said first and second side walls
  - 10          being attached to a separate one of the opposed ends of said rear wall to form a
  - 11          rectangular shaped assembly of upstanding walls;
  - 12          (c) a layer of microwave absorptive foam affixed to upper
  - 13          surface of said base and the interior of said first and second side walls, said front wall
  - 14          and said rear wall;
  - 15          (d) a rectangular shaped lid mounted on a upper edge of
  - 16          said rectangular shaped assembly of upstanding walls, said rectangular shaped lid
  - 17          being removable from said rectangular shaped assembly of upstanding walls, said
  - 18          rectangular shaped lid having a centrally located opening adapted to receive said low
  - 19          band antenna array;

20                   (e) a probe mounted in the interior of said test chamber,  
21                   said probe providing said RF test signal, said probe including:  
22                       (I) a foam spacer;  
23                       (II) a non-metallic pipe affixed to an upper surface  
24                       of said foam spacer; and  
25                       (III) a cooper wire wound around the exterior of said  
26                       non-metallic pipe; and  
27                   (f) a cable positioned within the interior of said test  
28                   chamber, said cable being connected to said copper wire at one end thereof said cable  
29                   extending through an opening within the front wall of said test chamber, said cable  
30                   having a female connector attached to the opposite end thereof.

1                   2. The test chamber of claim 1 wherein said non-metallic pipe comprises a one inch  
2                   diameter schedule 40 PVC pipe.

1                   3. The test chamber of claim 1 wherein said test chamber has overall dimensions of  
2                   10.00 inches in length, 8.00 inches in width and 4.00 inches in depth.

1                   4. The test chamber of claim 1 wherein said copper wire includes five helical turns of

2 #22 solid copper wire wound around the exterior of said non-metallic pipe.

1       5. The test chamber of claim 1 wherein said layer of microwave absorptive foam has a  
2 thickness of approximately 1.70 inches.

1       6. The test chamber of claim 1 further comprising a pair of alignment pins positioned  
2 adjacent the opening within said lid, the opening and the alignment pins of said lid allowing a  
3 user to precisely position the monopole antennas of said low band antenna array within the  
4 interior of said test chamber.

1       7. The test chamber of claim 1 wherein said test chamber allows for a measurement of  
2 an insertion loss over an operating frequency for said low band antenna array.

1       8. The test chamber of claim 7 wherein said insertion loss is not greater than -30 dB  
2 plus or minus 10 dB.

1       9. The test chamber of claim 1 wherein said rectangular shaped assembly of  
2 upstanding walls, said base and said lid are fabricated from steel.

1        10. The test chamber of claim 1 wherein said foam spacer has a thickness of  
2        approximately 0.5 inches.

1        11. A test chamber for testing a frequency response of an output for a low band  
2        antenna array having a plurality of monopole antennas by providing an RF (radio frequency)  
3        test signal into an interior of said test chamber, comprising:

4              (a) a rectangular shaped base;  
5              (b) first and second side walls extending perpendicularly  
6              upward from said base, a rear wall extending perpendicularly upward from said base  
7              and a front wall extending perpendicularly upward from said base, one end of each of  
8              said first and second side walls being attached to a separate one of the opposed ends of  
9              said front wall and the other end of each of each of said first and second side walls  
10             being attached to a separate one of the opposed ends of said rear wall to form a  
11             rectangular shaped assembly of upstanding walls;

12            (c) a layer of microwave absorptive foam affixed to upper  
13            surface of said base and the interior of said first and second side walls, said front wall  
14            and said rear wall, said layer of microwave absorptive foam having a thickness of a  
15            thickness of approximately 1.70 inches;

16            (d) a rectangular shaped lid mounted on a upper edge of  
17            said rectangular shaped assembly of upstanding walls, said rectangular shaped lid

18 being removable from said rectangular shaped assembly of upstanding walls, said  
19 rectangular shaped lid having a centrally located opening adapted to receive said low  
20 band antenna array;

21 (e) a probe mounted in the interior of said test chamber,  
22 said probe providing said RF test signal, said probe including:  
23 (I) a foam spacer;  
24 (II) a non-metallic pipe affixed to an upper surface  
25 of said foam spacer; and  
26 (III) a cooper wire wound around the exterior of said  
27 non-metallic pipe; and

28 (f) a cable positioned within the interior of said test  
29 chamber, said cable being connected to said copper wire at one end thereof said cable  
30 extending through an opening within the front wall of said test chamber, said cable  
31 having a female connector attached to the opposite end thereof; and  
32 (g) said test chamber allowing for a measurement of an insertion loss over an operating  
33 frequency for said low band antenna array, wherein said insertion loss is not greater  
34 than -30 dB plus or minus 10 dB.

1 12. The test chamber of claim 11 wherein said non-metallic pipe comprises a one inch

2 diameter schedule 40 PVC pipe.

1           13. The test chamber of claim 11 wherein said test chamber has overall dimensions of  
2 10.00 inches in length, 8.00 inches in width and 4.00 inches in depth.

1           14. The test chamber of claim 11 wherein said copper wire includes five helical turns  
2 of #22 solid copper wire wound around the exterior of said non-metallic pipe.

1           15. The test chamber of claim 11 further comprising a pair of alignment pins  
2 positioned adjacent the opening within said lid, the opening and the alignment pins of said lid  
3 allowing a user to precisely position the monopole antennas of said low band antenna array  
4 within the interior of said test chamber.

1           16. The test chamber of claim 11 wherein said rectangular shaped assembly of  
2 upstanding walls, said base and said lid are fabricated from steel.

1           17. The test chamber of claim 11 wherein said foam spacer has a thickness of  
2 approximately 0.5 inches.

1       18. The test chamber for testing a frequency response of an output for a low band  
2       antenna array having a plurality of monopole antennas by providing an RF (radio frequency)  
3       test signal into an interior of said test chamber, comprising:  
4             (a) a rectangular shaped base;  
5             (b) first and second side walls extending perpendicularly  
6               upward from said base, a rear wall extending perpendicularly upward from said base  
7               and a front wall extending perpendicularly upward from said base, one end of each of  
8               said first and second side walls being attached to a separate one of the opposed ends of  
9               said front wall and the other end of each of each of said first and second side walls  
10              being attached to a separate one of the opposed ends of said rear wall to form a  
11              rectangular shaped assembly of upstanding walls;  
12             (c) a layer of microwave absorptive foam affixed to upper  
13              surface of said base and the interior of said first and second side walls, said front wall  
14              and said rear wall, said layer of microwave absorptive foam having a thickness of a  
15              thickness of approximately 1.70 inches;  
16             (d) a rectangular shaped lid mounted on a upper edge of  
17              said rectangular shaped assembly of upstanding walls, said rectangular shaped lid  
18              being removable from said rectangular shaped assembly of upstanding walls, said  
19              rectangular shaped lid having a centrally located opening adapted to receive said low  
20              band antenna array;

21                         (e) said base, said rectangular shaped assembly of upstanding side walls and  
22                         said lid each being fabricated from steel;  
23                         (f) a probe mounted in the interior of said test chamber,  
24                         said probe providing said RF test signal, said probe including:  
25                                 (I) a foam spacer;  
26                                 (II) a non-metallic pipe affixed to an upper surface  
27                         of said foam spacer, wherein said non-metallic pipe comprises a one inch  
28                         diameter schedule 40 PVC pipe; and  
29                                 (III) a cooper wire wound around the exterior of said  
30                         non-metallic pipe, wherein said copper wire includes five helical turns of #22  
31                         solid copper wire wound around the exterior of said non-metallic pipe; and  
32                         (g) a cable positioned within the interior of said test  
33                         chamber, said cable being connected to said copper wire at one end thereof said cable  
34                         extending through an opening within the front wall of said test chamber, said cable  
35                         having a female connector attached to the opposite end thereof;  
36                         (h) said test chamber allowing for a measurement of an insertion loss over an operating  
37                         frequency for said low band antenna array, wherein said insertion loss is not greater  
38                         than -30 dB plus or minus 10 dB; and  
39                         (i) said test chamber having dimensions of 10.00 inches in length, 8.00 inches in  
40                         width and 4.00 inches in depth.

1           19. The test chamber of claim 18 further comprising a pair of alignment pins  
2   positioned adjacent the opening within said lid, the opening and the alignment pins of said lid  
3   allowing a user to precisely position the monopole antennas of said low band antenna array  
4   within the interior of said test chamber.

1           20. The test chamber of claim 18 wherein said foam spacer has a thickness of  
2   approximately 0.5 inches.